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The JOURNAL of GEOGRAPHY

A Monthly Magazine Devoted to the Interests of Teachers of Geography in Elementary, Secondary, and Normal Schools.

RAY HUGHES WHITBECK, *Editor* LAWRENCE MARTIN, *Associate Editor*
Of the Department of Geology and Geography at the University of Wisconsin

VOLUME XIV NOVEMBER, 1915 NUMBER 3

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Editor
RAY HUGHES WHITBECK.

Associate Editor
LAWRENCE MARTIN.

Of the Department of Geology and Geography, University of Wisconsin.

Contributing Editors, 1915-16

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V. C. FINCH, Business Manager

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The JOURNAL of GEOGRAPHY

Volume XIV NOVEMBER 1915 Number 3

IDEALS AND AIMS IN ELEMENTARY GEOGRAPHY

By the Editor

WHY is geography made one of the four or five fundamental studies in the schools of every enlightened country? If we were to go into any one of the thousands of elementary schools in the United States, we should find that geography is taught there. If we were to go into the schools of Canada, Europe, Australia, Japan, India, Argentina, Chile, Brazil, New Zealand, we should find geography classes in all of them. This is true whether the schools have inherited their ideals and practices from England or France, Spain or Italy, Russia or Portugal. Only a knowledge of reading, writing, and numbers is considered more basic. Occasionally a man is found who does not favor placing any stress on school geography, but such a man is so very rare that his views need receive no attention. The fact is: *I. The study of Geography in schools is nearly universal because the need of it is practically universal.*

How Shall the Study of Geography Begin?

The child's geographical knowledge is a matter of growth. He is born with none and the experiences of his pre-school days furnish him very little. Nor has he any hunger for geographical knowledge, for he does not feel any need of it. No one is likely to desire a thing until he thinks he has use for it. If it were possible in our educational practice to arouse in children a desire to know—a feeling of the need of knowing—before we had to offer the knowledge to them, our task of teaching would be easier. Unfortunately we think we must put children through a forcing-house process, and that means insisting that they learn a great many things which they have no visible need of, and do not see that they ever will have. Of course there can be no pleasurable mental reaction over the acquiring of things you don't need at least not so far as you can see. This is one reason why so much school work is irksome. The pupil doesn't see the use of the information you are giving him; if he could, he would not be inattentive. When he comes to you for information that he really wants, how eagerly he listens to what you have to say.

Since geography is one of the things which we know must be taught, the first step in the process ought to be a proceeding by which we shall start the little seven-year-old into a feeling of desire to know some of the things that geography will teach him. Until he has some little reason for wishing to learn, he is not in good condition to take the treatment. Our second point, then, is: *II. The beginning of geography teaching lies in making it evident that geographical knowledge will satisfy a want which the children have be-*

gun to feel. Needless to add, they will not feel this want by being told they have it, nor by explanations that later they will see the use of it.

By reason of the mere fact that they are young children and not grown-ups, they have certain interests and these are the teacher's avenues of approach. One of the child's earliest interests is in stories. The normal child loves stories, particularly stories about children and animals and strange places where people do wonderful things like driving a team of dogs, or riding camels. Now it would not be a wise use of time to hunt up these stories and spend school time in telling them solely to stir up a desire for geographical information. The stories should be worth telling for reasons quite apart from ulterior motives connected with geography. Good stories are a part of education, and they are more likely to be interesting when they deal with people and places and happenings which belong to a world beyond the child's daily life. Stories of the Eskimo, of the Indian, of children in China or Japan or Holland are the child's delight. Such stories gratify a perfectly natural interest, and their value is everywhere recognized quite apart from geography. But by selecting some stories which awaken a childish interest in the children and people of other lands, the way is made easy for the beginning of geography. Geographical information will now begin to have use in the child's world, for it gives light on things which interest him. He does not bother to reason out why he is glad to know where Russia or Scotland is; he simply is interested in that story of Boris or Donald, and he finds it satisfying to know something about the countries where they live. This, it seems to me, is the natural way for geography to begin.

When Shall Geography Begin?

Occasionally a school makes geography one of the studies of the second grade. More frequently it is put down as a third year study, but formal geography can scarcely begin earlier than grade 4. It may be introduced informally in connection with reading, stories, etc., as early as the teacher wishes. Surely in the third grade there ought to be a deliberate planning of the work so that stories of foreign people and places shall be introduced. At once the globe and map come into use—not as a formal matter, but merely incidentally, and with no elaboration. The child simply learns—if he has not already done so—that grown-up people use the map as a means of locating places or countries which they are reading about. Gradually geographical notions will be built up, ideas of the cardinal and semi-cardinal directions, of the earth's shape, of the cause of day and night, the equator and the hot belt, the poles and their cold. Most of these ideas will come out in connection with stories of the Eskimo, of the discovery of the poles, of the pigmies of Africa and the like. Definitions or formally worded statements are not yet needed.

All through the third year, the aim is to get *ideas*—perhaps they will be vague ones at first. We may be content, however, if we see the ideas growing, even though the child can not phrase them. When Asia or Europe or Japan

or Sweden are mentioned, point them out on the wall map. A large clear wall map should always hang in plain view. Gradually familiarity with the names and map pictures of the continents, the oceans, and some countries is acquired. Most children know people who came from foreign lands or who have traveled abroad. Papers and magazines have pictures of foreign places. All of these offer occasions incidentally to implant the idea that a part of one's daily life is to hear and know about people and countries across the sea; they are the teacher's opportunity to start the child out in his school life with a feeling that geography is worth while; and at this stage such a feeling is worth more than formal statements or definitions; these will come later; let ideas and interest come first.

III. Geographical ideas and an interest in geography are more important at the outset than formal statements.

What About Home Geography?

There is an old and respectable maxim that education should proceed from the known to the related unknown. Applied to geography this maxim gave us the so-called Home Geography. Home Geography is a good and proper thing. Assuredly, we wish the child to make use of the geographical materials around him. It has come to be a general practice to build up the idea of a map in the child's understanding by—

(1) drawing a plan of the school room, indicating in their proper places, seats, teacher's desk, book case, etc.,

(2) making a plan of the school grounds,

(3) making a map of the block in which the school is located, showing bounding streets.

There is a purpose in this: out of such exercises emerge ideas of the real purpose and meaning of a map. It is doubtful, however, whether the children of the fourth grade are ready to attempt drawing accurately to scale. They *can* do it, and if time enough is spent, they will produce a creditable map of the school room or city block. Drawing to scale is, however, the work of fairly mature minds. There is always a tendency to teach things about two years too hard for the pupils and so always to be working against difficulties of our own creation. Ideas which we can develop in the childish intellect only with painstaking effort and much drill would be grasped and digested readily a year or two later. The mind's power grows as the child grows, and we should do well if we were content to let our work progress at about the rate the mind develops instead of trying to be always a little ahead. In the long run nothing is gained. We must remember that ideas which involve much mathematical reasoning can be readily grasped at a certain stage of development, but can be grasped only with much explanation, illustration, and effort at an earlier stage of growth.

Home Geography should be taught in connection with all geography, drawing upon local illustrations whenever they will aid in getting clear ideas.

Experience seems to show, however, that a formal study of local geography continued more or less laboriously through weeks or months is a doubtful practice. On the contrary, studying things at first hand is always better than studying *about* those same things in books.

I am persuaded that early studies in geography should not aim at a high degree of exactness of knowledge or at accurate, formal statements, but rather at the development of a broad interest in peoples and countries, and a pleasure in reading and hearing about them. This is an attitude of mind. I would like to have my own children gain this attitude of mind in the first years of geographical study. Enough formal and exact knowledge will be acquired in due time; I would rather children should like geography at the end of the 5th year in school than be able to pass tests, if they can not do both; yet the two aims are by no means incompatible. That a procedure such as is suggested above may lead to desultory, aimless work is only too possible. If, however, there is a conscious aim to attain the end which is here recommended the work will not be aimless or desultory.

The Purpose of Geography

This all leads inevitably to the main question; that question is—*What is the geography teaching of the elementary school for?* Has it a major purpose? If so, what is it? Has it important subsidiary purposes? What are they? If we can decide what the answers to these questions are, we shall have made progress.

By reason of their inherent character, different studies lend themselves to different major purposes in the rounding out of the educated person. The study of *literature* makes for intellectual and moral refinement. That is its major purpose. The study of *mathematics* aims not at intellectual refinement but at training in accuracy, in exactness, and in close mental application and close reasoning. *American History* is a tool for developing patriotism and the qualities of citizenship.

What is geography's major purpose in the elementary school? I have thought over this question at times for many years and I always come around to the same conclusion, namely, that geography has both a utilitarian purpose and a cultural purpose, using the word "cultural" in the sense hereafter defined. Educational philosophy has passed the stage of regarding that certain branches of study are incomparably suited to giving a something called *culture*. Culture is an element of character more than an element of mind, and because this is so, the schools alone can not impart it. Contact with refined people breeds it; travel is one of the means by which it grows. Good reading, good art, good music, good drama contribute. But in the period of youth, the school is the agency particularly delegated with this culture-giving responsibility, though this is only a part of its responsibility. Broadly speaking the school aims to perform two main services:

(1) Teaching how to live. However, the immediate purpose in the lower grades is to give the child the ability to use the tools by which real education is later acquired: to learn to read, to write, to spell, and to compute.

(2) Teaching how to make a living.

A larger part—possibly a major part—of the knowledge and training which elementary geography gives, aims to fit the child to carry forward this and other school studies which follow. Yet most of this knowledge and training is of value even though the boy leaves school early in life. Either in the high school or in the workaday world he can, other things being equal, make better progress if he has a knowledge of the things which geography teaches and which no other branch is specifically responsible for teaching.

Geography Not Primarily a Bread-and-Butter Study

Let us grant that many a man is earning a living and is getting a good deal of satisfaction out of life, and doing both on a very limited knowledge of geography. Men have become millionaires and presidents who did not know whether St. Roque is a cape or a river, and the man who invented the roller process of making flour may not have known the "leading five wheat-growing states of the Union." Yet this and a great deal more may be granted without altering the general truth that geographical knowledge is a good thing and a useful thing; that it makes our reading more satisfying, our conversation more intelligent, our minds more broad, our sympathies more cosmopolitan, and our citizenship more enlightened.

Geographical Knowledge Gives Breadth of Outlook

But our educational system is organized definitely and properly on the assumption that the school is designed as much for developing men who shall be leaders in a small way or in a large way, as it is for preparing others for merely making a living. This great, busy, national life of ours calls for leaders of tens, and leaders of hundreds as well as leaders of millions. It calls for men who have gained some of the discipline and some of the outlook which comes only by education: and geographical study is one of the branches which give outlook.

Our schools are conducted with a view to the needs of society in all of its strata, the upper as well as the lower; the lower as well as the upper, yet they must always plan with full knowledge that they are training a proportion of their pupils for positions which require breadth of outlook, and a wide range of knowledge, both of the world of the past (history) and of the world of today (geography). No man is educated who knows only his own time and his own country. If culture includes the ability to see the "now" and the "here" in their relations to the longer period of the past and the bigger world beyond our own seas, then it gains some of its substance from historical and geographical studies. To me the term culture always implies breadth—breadth of knowledge, breadth of mind, breadth of sympathy—and all of these draw some of their nourishment from geographical studies.

If taught with much field work, geography trains the powers of observation; if taught with much map drawing it trains the eye and hand; if taught

as it was in my country-school days, it trains the memory. All of these are legitimate, all deserve some degree of emphasis, yet the study of geography is not a device or an invention for accomplishing even these worthy ends of training the observation, the eye, the hand or the memory. Such training is an essential by-product of the whole educative process. Unless literature, and history and arithmetic and geography are taught primarily for their inherent value, they possibly ought to give place to studies which are worthy of pursuit for their own content.

Without intending in the least to minimize the importance of training the powers of observation or imagination or the powers of eye and hand and memory, I am still convinced that geography has its own mission in the school. That mission is to give the broadest possible knowledge of peoples and countries, their cities, their industries, their achievements, and all that goes to make them strong or weak, leaders or followers among the nations of the earth; and the principal reasons why these things are as they are. This is plainly the *anthropo-centric* idea of geography as contrasted with the *geo-centric*. It makes *man* rather than the physical earth the starting point in the study of any region or country. It means the study of both man and his geographic environment, yet it does make man the center of interest. It is geography in which the human and social aspect is more prominent than the physical aspect.

Northern Pacific Guidebook

The U. S. Government has spent thousands of dollars in preparing a series of transcontinental guidebooks, telling the traveler of many of the wonders of the West which he sees from the car windows and concerning which he asks questions that none of his companions can fully answer. The Northern Pacific Guidebook, one of this series, has just been published by the United States Geological Survey as Bulletin 611. This volume, like the other three of the series, is to be sold by the Superintendent of Documents, Washington, D. C., at $1 a copy. The book is in no sense a purely geologic publication, although the geology of the route is described in terms that can be readily understood by the layman. The mountains, plains, river valleys, and rocks that are seen from the car window as apparently unrelated items in the landscape are described as parts of an orderly procession, and the story of their birth and growth is so simply told as to interest the most indifferent reader.

The Northern Pacific Guidebook includes 212 pages and contains 27 reproductions of photographs, 38 text illustrations, and 27 topographic maps covering the entire route, which have been prepared with a degree of accuracy never before attempted in a guidebook.

THE WEATHER FACTOR IN THE GREAT WAR: III.

MAY TO OCTOBER, 1915*

By Robert De C. Ward
Harvard University

THE last month of spring and the three months of summer have come and gone. Yet the Great War continues. And heat and cold; rain and snow; cloud and sunshine; storm and calm—all continue to play their part, as they have been doing in all man's wars since the world's beginning. As compared with the greater turbulence and the severity of the winter, Europe's summer weather is peaceful and uneventful. Its human, its economic, its strategic relations are less striking. But to anyone—be he military expert, or meteorologist, or simply an intelligent reader of the world's news—there is vital human interest in the many varied and far-reaching controls which the ordinary day-to-day round of European weather has exerted in the progress and conduct of the Great War.

Strategic problems of great difficulty, demanding the most careful thought, and requiring immediate solution, grew out of the spectacular German "drive" into Russia, and the remarkable withdrawal of the Russian armies under the Grand Duke Nicholas. The German plan to entrap and annihilate the Russians failed.** Instead of destroying and capturing the armies of the Grand Duke, and then removing a large part of their troops elsewhere, the Germans were obliged to pursue their enemy farther and farther into his own territory; farther and farther from their own bases of supplies, and nearer and nearer to the home of the Russian winter. The desperate energy of this remarkable drive had one of its mainsprings in the necessity of reaching a military decision before the autumn rains and winter cold set in. The burned and devastated fields of Poland were bad enough while the weather was reasonably favorable. They would be a thousand times more terrible when snow-covered, and swept by icy gales and blinding snowstorms. The tremendous activity of the Germans in seeking to gain possession of the Polish and Russian railways was doubtless in large part due to their need of securing every possible line of railroad for keeping their armies supplied with provisions and ammunition when the autumn rains had made transportation across the flooded marshes and muddy roads impossible. Clearly, the situation was very serious. We may easily picture to ourselves the frequent discussions of this problem on the part of the German general officers. We may be sure that the Russian Winter loomed very large in all their plans of campaign. How far to penetrate into Russia; how much longer to carry on operations in the Polish marshes with the autumn rains not far away;

*The period from Aug. 1, 1914, to May 1, 1915, has been covered in the following articles: "The War and the Weather during the First Three Months of the Fighting," *Pop. Sci. Mo.*, Vol. 85, Dec., 1914, 604-613; "The European Winter and the War," This Journal, Vol. XIII, Feb., Mar., 1915, 169-171, 209-216.

**This article was completed Sept. 25, 1915.

where to dig themselves in for the winter; how to avoid even the faintest suggestion of such a disaster as that which befell Napoleon's Grand Army—these were questions whose settlement required a knowledge and a careful consideration of the weather factor. That the German commanders have this knowledge, and know how to make it of practical use in their everyday military activities, the Great War has abundantly made clear.

That the German and Austrian advance was made under many meteorological difficulties is easily seen if we read the despatches carefully. The weather of June is described as "exceptional", with "persistent" and "unseasonably heavy" rains over the greater part of Russia and Galicia. Then, and later, the flooded marshes and muddy roads made the advance of the attacking armies difficult and slow. Often the guns could be moved only when double-spanned and with the help of the gunners, who put their shoulders to the wheels. All such delays helped the Russians, by giving them time to fall back more slowly, and to make better plans for resistance on other lines. London and Paris looked forward to the coming of the "equinoctial" rains as an almost certain check to the German advance. English military experts emphatically expressed it as their opinion that these autumn rains were "the danger limit to military operations in the eastern field." Some of them recalled the fact that these same storms marked the turning point in Napoleon's campaign. The light snows of fall gave the warning. The heavy snows which came later brought the great disaster. In this year's early September rains, many of the Russian rivers overflowed their banks; roads became quagmires; marshes were flooded. A decisive battle between large bodies of troops seemed out of the question. Thus one of the German's objects in this whole eastern campaign was defeated. Last winter the Germans declared that the fall of Warsaw, which they finally accomplished, was only a question of mud!

Italy's entrance into the war, with the resulting military operations at high altitudes, brought in a new series of meteorological controls which the other theatres of war at lower levels did not offer. High mountains mean cold and snow, even in summer. They mean more clouds, and rain, and thunderstorms, than the lowlands have. They mean exposure to great extremes of heat and cold. The Russian and the Teutonic allies in the Carpathian snows; the Russians and the Turks in the mountains and highlands of Asia; the Italians and the Austrians in the Alps, have thus far had the hardest fighting against weather conditions. It is significant that the despatches from the Austro-Italian war zone, meagre as all such despatches have been, have frequently emphasized the meteorological handicaps. Over and over again, heavy rains and "fog" have checked the fighting in the mountains. Swollen rivers; flooded passes; deep mud; "bad weather" were to be expected, even in summer. The "fogs" so often mentioned were probably in most cases not valley and lowland fogs but clouds, for much of the fighting has taken place at altitudes well within the cloud zone. These "fogs" often interfered with artillery firing and with aeroplane trips, but were several times taken advantage of, by one side or the other, for making surprise attacks. "Terrific" thun-

derstorms occurred. Lightning played among the troops fighting on the rocky mountain sides. Torrential downpours swept the passes and temporarily stopped the engagements. Hail beat in the faces of the men as they charged up the steep passes and slopes. Much difficulty was experienced on account of the snow. A despatch from Brescia, June 21, notes the occurrence of a heavy snowstorm on Monte Altissimo, with temperatures "below zero" (Centigrade, doubtless), and a resulting suspension of military operations. The despatches of June 24 mentioned that there were then more than 2 feet of snow on the lofty Stelvio pass, where spirited fighting was going on. On July 1 it was reported that "the mountaineers (Tyrol) do not remember a season when there has been so much snow on the heights on July 1. The mountain streams, which are usually dry at the end of June, are now deep and almost impassable. The Italian troops are encountering snowstorms and thick fogs, which have interfered with long-range firing." Early in September we read that both Italians and Austrians were preparing for important battles "before winter." The winter fighting along the Austrian-Italian line will have to be done on the lowlands. The higher mountains will be impossible battlegrounds. Snow was falling in the Alps toward the end of September, interfering with the campaign.

It was to be expected that the weather conditions over the western theatre of war would have but little effect during the summer, for this is not a season of heavy rains, or of violent storms, or of intense heat, in that region. There seems to have been but one direct reference to the heat, and that was during the desperate fighting in the "Labyrinth," late in May and early in June. The sun was then so hot that the men fought bareheaded and without their coats. Late and apparently heavy spring rains fell about the middle of May. The ground became water-soaked and slippery. Trench fighting, which was active in the early part of this spell of bad weather, gradually came to a stop. Cannon firing was impossible (May 19) owing to the thick mist. Occasionally, at other times through the summer, rain and fog interfered with military operations in the western zone.

The summer "dry season" of the Mediterranean region made itself felt in the Gallipoli Peninsula. "No rain since June"; "water quite inadequate" to the needs of the troops; "unbearable dust"; are reported from there. Doubtless the troops suffered greatly from the dust, if not also from thirst. The autumn rains are sure to bring relief in these respects. On the other hand, the approach of these autumn storms has doubtless spurred on the Allies to try to force the Dardanelles before the high winds and rough water interfere with their naval operations. With the wind in certain quarters, no landing on the Gallipoli Peninsula has been possible.

As predicted by the writer early in April*, German Zeppelin raids against England became much more frequent as the more favorable weather of late spring and summer brought better conditions for air navigation. The

*Journal of Geography, June, 1915. Vol. XIII, p. 315.

damage and the loss of life caused by these raids seem so far to have been very slight, the reason doubtless being that the attacks are usually made on dark nights, when landmarks are hard to make out. As during the winter, cloudy or "foggy" nights seem to have been selected for several of the Zeppelin attacks. Unfavorable weather did not always ensure safety to the English. Thus, a London despatch of August 10 noted that "the continual bad weather which has been prevailing in England would, it was believed, prevent the Zeppelins from coming last night." They came, however, in spite of what was reported as "a big storm on the east coast." The night was dark, and there was a thick fog, so that flying by the English defending aeroplanes was very difficult. On another occasion, a despatch from Holland reported the passage of four dirigibles on their way to England. These turned back, however, probably because the night was too clear. On Aug. 18 Zeppelins raided the eastern counties. English air patrols were active, "but owing to the difficult atmospheric conditions the Zeppelins were able to escape."

In mid-July (13th), 35 French aeroplanes raided Vigneulles-les-Hattonchatel, an important German strategic station, under the greatest difficulties. The wind was reported to be 40 miles an hour (?). The destruction of the aeroplanes was imminent, and the airmen had to drop down within close range of the German anti-aircraft guns in order to make sure that the bombs would not be diverted from their course by the gale. This is a point of unusual interest. On July 30 a squadron of 45 French aeroplanes set out to bombard some German petrol works in Alsace. "A cloudy sky and many mist (fog) banks" prevented some of the squadron from reaching their destination, but the rest did their work satisfactorily, and all came back safely. A very similar experience attended a raid of 32 French aeroplanes against Saarbrucken, the sky being cloudy and the valleys concealed under a heavy fog. Early in August (2nd) a French captive balloon was torn from its anchorage during a thundersquall, and was captured within the German lines. It is significant that the Zeppelins have recently been repainted, a leaden gray, like the war paint of our battleships, so that they may not easily be seen when flying under clouds. This is a good illustration of man's adaptation of his own inventions to the meteorological environment in which they are used.

In connection with the German military meteorological service which has been of such very great importance to the German Armies from the beginning of the war, it is worth while to note, at this point, what happened in Belgium last August (1914). These facts are taken from the Belgian *Gazette astronomique*, now published in England (No. 9, 1914, published in April, 1915). The Belgian Observatory at Uccle was made a "field weather station" of the German army on Aug. 20, 1914. Similar stations have been established at Liege, Namur, and at points on the coast. Under a military escort, four German meteorologists at once moved into the observatory, and began observations, both of surface conditions and of the upper air currents. The latter observations were made by means of ordinary pilot balloons and of electrically lighted balloons at night. The results were telegraphed to the

Deutsche Seewarte, in Hamburg. In November, 1914, the Uccle Observatory was made the "field weather center," i. e., it became the headquarters of all the German field weather stations on the western front. Some of the Belgian astronomers who stayed at the observatory have been allowed to continue their work. All the regular meteorological work at Uccle, including the publication of the daily weather maps, has been stopped.

The use of asphyxiating gas by the Germans has given a new and peculiar importance to the weather factor in the Great War. The whole relation between the amount of gas to be liberated and the wind conditions, both as to direction and velocity, seems to have been worked out by the Germans with the greatest care. If the wind is too strong, the gas is too widely diffused. If the wind is variable, or if there is a calm, the user of the gas is himself liable to be asphyxiated. But when the wind is steady, of moderate velocity, and in the right direction, the fumes spread out over the ground like a low fog, and do their deadly work. There are reports of but two cases in which the Germans were themselves forced to retreat before their own gases, owing to a change in the wind. As a rule, we may be certain that the gas was not used unless the meteorological observers with the German armies gave reasonable assurance of favorable wind directions and velocities. Europe is in a zone of prevailing westerly winds. It is clear that when the Germans used gas along the western battle front, they waited for rather gentle northerly, northeasterly, or easterly winds, such as may be expected in that region when there is somewhat higher pressure to the east. On the eastern battle-line, on the other hand, gentle westerly winds, have on the whole been the favorable ones. The most favorable wind direction at any point depends, of course, upon the trend of the battle-lines at that particular place. Much attention has been given by the Allied commanders to methods of meeting gas attacks. The suggestion has been made that a counter-current of air should be produced, by fans driven by gasoline, in order to drive back or lift up the cloud of poisonous gas.

On the naval side of the war there have been some incidents worth recording. In the British naval attack on the Belgian coast towns (held by Germans) in August, the ships took advantage of the morning fog; came closer inshore than would have been possible in clear weather, and were able to defy any effective reply from the Zeebrugge garrison. In the naval action of the Baltic early in July we learn that the Germans also took advantage of a dense fog in order to come closer to land. The Russians had great difficulty in seeing the enemy, and their fire was inaccurate. In order to protect a German mine-layer, which was in distress (Petrograd report), the German torpedo boats tried to assist her escape by throwing volumes of thick black smoke out of their funnels, thus making the fog even more dense.

The importance of securing an ice-free port for Russia is one of the great strategic problems of the war. Archangel is fast becoming a very busy port, but its use is greatly limited because it freezes up in winter. Russia has lately bought some new ice-breakers and hopes to keep the harbor open much later than usual. But a port on the south, open the year around to the

world's commerce, has long been Russia's supreme desire. And in her present military situation it is almost a supreme necessity. This gives the opening of the Dardanelles and the Bosporus before winter an importance which the Allies have long recognized, and have evidently put forth their utmost efforts to attain. The fall of Libau, early in May, was a serious loss to Russia.

Preparations for a second winter campaign were begun in July and August. A Berlin dispatch, dated July 26, reported that the army authorities announced officially "that the requirements in the way of warm underclothing, gloves and wristlets for the German soldiers' use in an eventual winter campaign have been amply covered." A report from the Hague said that the German "grass green" uniforms of summer are to be replaced by field-gray for the winter. Thus does man adopt protective coloring devices depending upon the season. A Paris despatch of Aug. 31 mentioned France's preparations for the winter. And one from Budapest, Aug. 24, says: "Great efforts are being made for a winter campaign. Last winter's experience proved sickness and frostbite are dangerous enemies, and in consequence large orders have been placed for wool-lined coats and thick woolen boots. All tailors and clothing houses are busily engaged in preparing the winter clothes of the soldier." Italy, also, has made her preparations for the winter. Our own manufacturers of heavy clothing, knit goods, hosiery and footwear long since received orders for supplies of winter clothing for the European armies.

United States Leads in Exports

For the first time in its history the United States leads the world as an exporter. Occasionally it has surpassed the United Kingdom in the exportation of domestic products, but it was only in the fiscal year ended June 30, 1915, that the total American exports, domestic and foreign, exceeded those of the United Kingdom.

The total exports in the fiscal year 1915 aggregated $2,768,600,000, as against $2,170,100,000 for the United Kingdom, the figures representing in the case of the United States an increase of 17 per cent, and in the case of the United Kingdom a decrease of 30 per cent when compared with last year.

American exports in the fiscal year 1915 included domestic products to the value of $2,716,200,000, against $2,329,700,000 in 1914; and foreign products, $52,400,000, against $34,900,000 in the preceding year. British exports in the same periods included British and Irish produce, $1,744,100,000 in 1915, against $2,557,200,000 in 1914, and foreign and colonial produce, $426,000,000 in 1915 compared with $526,500,000 in 1914.—[*Commercial America.*]

HOME MADE MAPS AND ATLASES

By Robert M. Brown
Rhode Island Normal School, Providence

BECAUSE of the lack of funds many teachers, especially those in rural communities, are deprived of the use of good maps for work in geography, history, literature, etc. In many instances the one or more maps which form a part of the equipment of the school, are legacies from the time when ideas concerning wall maps were crude and illogical, so that they offer little incentive to fresh and vigorous work. In the present days when teacher-training is so extensively demanded, it is within the bounds of reason to expect of the newer generation of teachers a broader view of their craft, and ingenuity enough to improve the equipment and surroundings of most school rooms. In the decoration of the school room, in the improvement of school exteriors, in devices for seat-work in elementary grades, and in the appliances for nature study, a great advance has been made. If the activities so well inaugurated in these lines could be spread over all the branches of the curriculum, the result would be remarkable.

Board work has become a usual achievement and it is common to find elaborate designs of calendars, of illustrations of stories, and of decorative emblems on the blackboard. It is only a step further to the construction of a good blackboard map. The step is not an advance in skill so much as in a knowledge of what constitutes a good map. First, it is necessary to put upon the board or upon paper, if the map is to be preserved, an outline of suitable size. There are a number of methods which may be used, but for most purposes the use of coordinate lines is the simplest. Draw squares of any convenient size, as for instance one half inch, over the map to be enlarged. Then on paper or on the blackboard lay off the same number of squares of two, four, or six times the length. Finally square by square draw in the enlarged network the map as it appears in the smaller network. Not only may the outline be drawn on a larger scale in this way but the locations of important cities, the boundaries of physiographic provinces, and the position of railroads may likewise be transferred. The network thus drawn is purely arbitrary and the squares are of no value after serving the ends stated; consequently they should be drawn with light strokes and erased when the map is done. The parallels and meridians on a map would serve as well as the squares but the inequalities of distance and especially the curvatures in many cases do not render them easily susceptible to enlargement.

With an outline of proper size to use as a wall map, the topographic features of the country may be inserted. It is assumed that a topographic map is more valuable than a political map, or rather, that a topographic map which shows political divisions is much more legible than a political map which shows topography. Topography may be inserted in color by the use of colored crayons. A three-fold scheme for the land, lowlands below 500

feet, uplands, 500 feet to 1650 feet, and highlands above 1650 feet, with water colored blue; or a four-fold scheme, dividing the area above 1650 feet into highlands, 1650 to 6500, and mountains, above 6500, may be used. The colors should be as uniform as possible since they are in themselves meaningless, and ease in reading maps can only come as symbols become widely used and agree in character. Consequently it is well to strive to imitate the shades of the best maps and those in general use are green for lowlands, a light brown for uplands, a darker brown for highlands, and a very dark shade for mountains. Crayons frequently give two shades of brown, a burnt sienna and a burnt umber. A light application of the former for uplands and a heavy application of the umber for mountains form a good combination. In the newer maps which strive to follow a uniform scheme of color, there is the greatest discrepancy in the use of the color for upland areas; some publishers preferring a yellow, others white, and still others a buff color. A widely accepted scale of coloring, although too elaborate for the neophyte to adopt, may be found on the sheets of the 1:1,000,000 map of the world, a number of sheets of which have been issued by the United States Geological Survey at Washington. When the topography map is completed, upon it as a base, boundary lines may be drawn in heavy red lines.

The chief danger in work of this sort lies in the crudeness of the product. Colors put on without a sense of values may give erroneous impressions and over-emphasize one area at the expense of another. This danger, however, can be shunned as the experiences multiply, and at its worst, it cannot be more serious than results from the bizarre history charts generally accepted by school authorities.

It is probable that a teacher undertaking a task of this nature for the first time will over-estimate the value of her first product and take greater pride in it than in later, more finished works. She should therefore submit it to fair criticism and test its efficiency constantly, and by repeated trials a map may be produced that will be of good pedagogical value. Maps of other countries may be added until a very creditable series of maps is obtained.

In many schools a great handicap to good teaching in geography results from the absence of a good topography map, and in others from ignorance concerning the use of such a map. Pupils have been led to learn laboriously the paragraphs on physical features and climate, and from these a recitation is afterwards demanded. The painful attempts on the part of the pupils to visualize the printed page contrasted with the training which results from formulating into words his impressions of a good map are unworthy of our schools. An English writer* states that the general sequence of cause and effect in geography may be divided into (1) a few preliminary climatic principles, and (2) a mode of applying these to particular countries. There is no reference here to topography but it is implied in the text that the school possesses and will use maps showing the physical features. In addition to the map showing the divi-

*Archer, *The Teaching of Geography in Elementary Schools.*

sion of the land into lowlands, upland and highland, a climatic map may be made to show the annual distribution of rainfall (in varying shades of blue) and the temperature of the January and July isotherms. With the location of important centers on the topography map in large black dots the two maps will form an adequate background for good elementary work in the geography of the area.

Most of the original sources for the construction of these maps are beyond the reach of the majority of teachers, but generalized products from them may be had without great inconvenience. Text books furnish topography and rainfall maps of grand divisions, but for the minor divisions the teacher will be able to borrow one of the many small school atlases, such as the Longman's *New School Atlas* or the Sydow-Wagner's *Schul Atlas*. Some of the requirements for wall maps were published in the Journal of Geography recently*.

A reference atlas, if no such volume is at hand, is not beyond the scope of the teacher's ability. Maps are being published today in great quantities, and railroad and steamship lines spread them widely. Papers and magazines illustrate articles by maps, many of them of small areas but a few of more extended lands. Plan an atlas of a loose leaf type so that it will be possible to insert maps from time to time as they are available. In putting the sheets together it would be well to follow the order of regulation atlases; a map of the world may be obtained from any one of a number of steamship lines, or for this and the maps of the continents, the pages from a discarded text book may be pasted on to the atlas sheets. Watch the magazines and papers for detailed maps; use railroad folders freely and it will be surprising how soon the blank spaces are filled. In this as in all map dealings discrimination has to be practiced. The teacher must appreciate that every published representation of an area is not worthy of a place in the school room. Some railroad maps, for instance, so distort the shape of the country that they are misleading and many of them over-emphasize the straightness as well as the importance of their respective lines. In using old maps, it is advisable to make sure that no change in the boundaries of provinces has been made. An example of this may be found in Canada, where, during a number of recent years, changes have been made in the provincial boundary lines, the last revision being in 1912. An atlas of this kind could be used as a record of current changes. Most teachers read some paper covering the topics of the day and are constantly reminded of the changes in importance of towns, in industrial centers, and in political boundaries. A teacher should have some way of recording these data, for in a year or so the maps of the newest text book are frequently out-of-date. Thus with the practice of very little ingenuity and with a modicum of skill, a school may be equipped with a creditable series of wall maps and a reference atlas which is the latest thing out.

*Notes on Wall Maps, Vol. XII, No. 7, p. 208. March, 1914.

THE RANGE AND TOWNSHIP PLAN OF ROADS

THIS scheme of north-south and east-west roads prevails so widely in the central United States that it will probably surprise the people to know that main travel in those regions has never followed the plan and that it cannot be regarded as at all satisfactory.

In places that have been long settled roads lead as directly from one center of population to another as is allowed by the obstruction offered by ponds, swamps, and hills. If one place lies seven miles northeast of another, you travel a little over seven miles between them on a road that is constantly swinging a little from side to side on one general direction. If the neighborhood be hilly, the deviations from the direct course may lead to all the directions of the compass. In Michigan and other parts of the interior, in order to reach a point seven miles away to the northeast, theory calls for five miles east and five miles north. All the rural districts of the West are laid out in such mile-wide meshes of roads. To satisfy the scheme over three-quarters of the roads there run north-south or east-west. Country people are so used to these roads that angling ones, or roads that have taken on a meandering habit from association with streams, are regarded as exceptional and lawless. As a matter of fact roads between points of real importance always do angle unless they may be connected by east-west or north-south lines. The rectangle roads are only in actual use in thinly-inhabited country districts a little off main lines of travel. A good illustration is the district in Michigan just southwest from Lansing, the capital. From Lansing a road runs obliquely to the southwest for forty-five miles to Battle Creek. This is crossed near its middle, at Charlotte, by another running obliquely from southeast to northwest, from Jackson toward Grand Rapids, although the dominant road-pattern of the whole district is the one-mile square. And the same thing is true of all points of real importance. Roads run pretty directly between these in the Middle West just as in the East. The Range-Township system prevails mainly in the rural districts. It does, however, tend to introduce undesirable jogs into fairly direct roads. A striking example of this is the *West Michigan Pike,* between Montague and Shelby. The road has eleven turns in it, all square corners. Shelby is due north of Montague, fourteen miles away and eleven miles of the direct north road is laid out as road, but none of this is followed by the West Michigan Pike, which makes three miles westward in three stretches of different lengths, fourteen miles northward in six stretches, and three miles eastward in three more, a total of twenty miles.

The fact is the Range-Township system is not a road-system at all but a system of land surveys and the simplest one imaginable for dividing and describing unexplored lands, and making it possible to identify them on the ground. With one or two meridians and base-lines marked out in each state, every point may be described and reached quickly and surely. It is natural enough to put in the roads along the north-south and east-west boundaries. It

apportions them evenly among owners and provides an abundance of them. But this procedure makes no provision for the characteristics that should belong to a good road. The convenience of the survey does not extend to the roads.

A road should lead as directly as possible to its destination. All its deviations from the straightest possible course are defects. The nature of the ground compels some deviations, but to plan them as a part of a survey system is to make the roads worse in order that the survey may be simpler or more convenient. The rectangular road system as a part of a survey was first used by the old Romans on the plains of the Po, but without north-south, east-west alignment. The settlers in southeast New Hampshire tried to use it in granting lands between Exeter and Lake Winnepeseogee, as may still be seen in that region on many an abandoned weather-gullied roadway straight up and down almost impossible hills alongside the less direct, but better graded modern highway. The Canadians use a similar system in Ontario with squares of 1000 acres and roads parallel and perpendicular to the Lake Shores. As a system of surveys it has been of great convenience in settling the middle west. As a system of road planning it is only tolerable for roads of little use.

Mark Jefferson.

TO TEACHERS OF GEOGRAPHY IN WISCONSIN

Mention has been made in the Journal of Geography of a movement of leading geographers to form a National Council of Geography Teachers. To this end, a representative committee designated the Inaugurating Committee is at work. Professor George J. Miller of Mankato, Minnesota, is chairman. In order to facilitate the work of organization, an appointee in practically every state in the Union has been named to assist in forming State Councils of Geography Teachers, such State Councils to be organic parts of the National Council. During the session of the Wisconsin State Teachers' Association in Milwaukee, the regular meeting of the Geography Association of Wisconsin will be held. A program is now being arranged by professors Lucius T. Gould of Milwaukee Normal and Professor R. H. Whitbeck of the University. Nearly all the members of the old Association are in favor of combining, in one organization, the present Association and the State Council. There are some excellent students and teachers of geography in the Badger State, and the time has come when concerted action of this body must be pronounced in order that it may be influential. Wisconsin should have one of the best State Councils in the Union; the talent is in the state to accomplish this end. All teachers and students of geography are cordially and earnestly invited to attend the Association meeting in Milwaukee, announcements of which will be forthcoming.

W. J. SUTHERLAND,
Chairman State Council.

GEOGRAPHICAL MATERIAL ON CANADA

The Physical Features and the Natural Resources of Canada*

THE area of the Dominion of Canada (3,730,000 square miles) is somewhat greater than that of the United States including Alaska, and rather less than that of Europe.

In Canada, as in every other country of the world, the physical features have played, are playing and will continue to play a most important part in the development of the history of the country and the character of its people.

An enormous expanse of 2,000,000 square miles, representing more than half the whole area of the Dominion of Canada, forms a rugged and, for the most part, barren tract, which, driven down like a wedge into southern Canada, separates the older settlements of eastern Canada from the new provinces of our West. It cuts Canada in two and has in this way exerted a most potent and in some respects a sinister influence on the development of our Dominion. The cost entailed in building the line of the Canadian Pacific railway across this barren tract of country for the purpose of uniting eastern and western Canada was enormous, and few better examples of the influence of the physical features of a country upon its development and history can be cited than that of this ancient protaxis upon the development and history of Canada.

Water Powers

It is doubtful if there is any country in the world which is so abundantly supplied with water-powers as the Dominion of Canada. The total water-power which is available for use cannot yet be calculated, but it is enormous. The following table, however, gives the number of horse-power which had been developed from the water-powers in our several provinces in the year 1911. This will of course be immensely increased as years go on.

	Horse-Power		Horse-Power
Ontario	532,266	Saskatchewan	45
Quebec	300,153	Alberta	7,300
Nova Scotia	15,272	British Columbia	100,920
New Brunswick	9,765	Yukon	2,000
Prince Edward Island	500		
Manitoba	48,300	Total for Canada	1,016,521

Minerals

The mineral deposits of Canada are of great extent and importance. The mineral output is increasing very rapidly and in the year 1913 had a value of $144,000,000. Our coal resources, as shown by the investigations undertaken in connection with the International Geological Congress which was held in Canada last year, are in extent second only to those of the United States.

*Extracts from the Presidential Address of Prof. Frank D. Adams of the Royal Society of Canada, 1914.

The geological structure of the Dominion, moreover, is such as to lead to the confident belief that as detailed exploration is carried forward in northern Canada, large deposits of the metallic minerals will be found in that portion of the Dominion, so that the mining industry of the Dominion, there is reason to believe, will play a very important part in the future history of the country.

Agriculture

Agriculture is and must always remain the chief industry of the people of Canada. The population which the Dominion can support in the future will depend chiefly upon the area of land suitable for farming which exists in Canada and the manner in which this is cultivated.

The fact that Canada occupies more than half of the continent of North America and has an area almost identical with that of Europe is sometimes mentioned as carrying with it the implication that it would afford support to an almost unlimited population.

It is impossible at the present time to arrive at an accurate estimate of the actual area of arable land in the Dominion, but there is practically no land which can be properly cultivated in that portion of Canada which lies north of the area covered by a forest growth; with the possible exception of the clay belt in northern Ontario, there is no part of "the Canadian shield" which can support more than a very sparse farming population or in which farming can be made a really profitable industry. The area of arable land in British Columbia, as compared with the size of the province, is quite small.

There are only two great areas of land capable of continuous cultivation throughout their entire extent and of thus supporting a large agricultural population. The first of these is the plain lying between the southern margin of "the Canadian shield" and the boundary line of the United States, in Quebec and Ontario, extending from the hilly or mountainous district of the Appalachian folding in eastern Quebec to the Great lakes. The second is the southern portion of the plains in the provinces of Manitoba, Saskatchewan and eastern Alberta. These are classed together as the Great Plain of Central Canada, and include upwards of 470,000 square miles of farming and grazing lands.

Forest Products

The forests of Canada were its chief source of revenue in the early days of the settlement of the country. Year by year great rafts of timber were floated down the St. Lawrence and Ottawa rivers past Montreal and were loaded on fleets of ships at the port of Quebec. Later, with the advent of railways, the same lumber was brought in immense quantities by rail to Montreal or shipped directly to its market in the United States.

The following figures show the yield of products of the forest (wood) annually for census years going back to 1870, expressed in feet board measure:

	Feet Board Measure
1870	2,951,134,352
1880	6,174,605,544
1890	5,529,993,716
1900	4,131,702,968
1910	5,696,537,260

A careful study by the official forester of the Dominion shows that the reserves of merchantable soft timber in the forests of Canada are only between one-fourth and one-fifth of that remaining in the forests of the United States. Of these reserves in Canada, about one-half are in the old provinces of eastern Canada and the other half in British Columbia.

It must be borne in mind that while a large part of Canada is covered with forest, much of this is a woodland country rather than a country covered with a forest which produces considerable supplies of merchantable timber.

One authority states that the area of land which is used for farming and grazing purposes in the Dominion at the present time may be set down at 50,000,000 acres and that a conservative estimate would make the area available for these purposes six times as great, that is to say, 300,000,000 acres or about 470,000 square miles. This estimate, which includes not only farming but grazing land, is probably too low.

THE FISHERIES OF EASTERN CANADA*

The fisheries of Eastern Canada fall into two distinct divisions, the deep-sea and the in-shore or coastal fisheries.

In-shore Fishery

The in-shore fishery is the more important of the two, inasmuch as it employs about eight men for one that is employed in the deep-sea fishery. It is carried on in boats carrying two or three men, and at a distance of from one to five miles from the shore. A small class of vessels, carrying four to seven men, is also used on the nearer "banks" lying twelve to fifteen miles out; while many fixed fishing contrivances, such as traps, drag-seines, and weirs, are operated from the shore. Boats engaged in the hook-and-line fishery leave harbour about daybreak and return in the course of the afternoon, while vessels of the small class remain two days and sometimes a week on the fishing grounds before returning to harbour.

The kinds of fish taken from the in-shore waters are cod, hake, haddock, pollock, halibut, herring, mackerel, shad, alewives, smelts, flounders, swordfish, sardines, salmon, lobsters, oysters and clams. Herring is the chief bait-fish used in line fishing; but when these are scarce, clams are largely used as a substitute. Squid, a kind of cuttlefish, when obtainable, is a favourite bait.

*Abridged from a paper by J. J. Cowie, Department of Marine and Fisheries, Canada, in "Sea Fisheries of Eastern Canada," pp. 94-110.

Off-shore Fishery

The deep-sea or bank fishery is pursued in substantial fore-and-aft rigged sailing vessels of from 60 to 100 tons, carrying crews of from 12 to 20 men. Operations are conducted on the many shallow stretches known as "banks" which lie between the outer edge of the in-shore area and the deeper waters of the Atlantic, ranging from the "Grand Bank" lying southward of Newfoundland to "Browns Bank" off the western end of Nova Scotia, also on the many banks in the gulf of St. Lawrence, around the Magdalen islands, and between Cape Breton and Newfoundland. The fish are split and salted down in the hold of the vessels at the end of each day's fishing, and when the hold is full, or the supply of salt gives out, the anchor is hove up, and a course shaped for the land. The kind of fish taken by vessels on the off-shore grounds are cod, haddock, hake and halibut.

A Stationary Condition

In the course of the fifteen years from 1870 to 1885, a steady advance was maintained in the value and importance of the fisheries of our four eastern provinces. The value of all kinds of fish caught by the fishermen of those provinces during the former year amounted to over $6,000,000, while in the latter year the value rose to no less than $15,000,000. In all of the four provinces there were employed in 1870, on board of vessels and boats, 27,385 fishermen, while at the end of the fifteen-year period in 1885, the number had increased to 51,498. The aggregate value in 1910 shows an increase of only $834,900 over that in 1885, while the increase in the number of men engaged only amounted to 683 in the course of a quarter of a century.

Cod Fisheries

Of all branches of the fisheries of the east, the most important is the cod fishery, and so far as money value is concerned, it remains the leading branch of the Atlantic coast fisheries. The counties along the south shore of Nova Scotia produce the largest quantities of this fish; but the majority of the fishermen of this district give their whole time and attention to fishing, and are in possession of a fine type of fishing boat. These facts account for their success in this as in other branches of the industry.

Of all the cod-fishing waters of Eastern Canada, probably the most prolific are those of the gulf of St. Lawrence, around the Magdalen islands, on the north and east coasts of Prince Edward Island, the north coast of Cape Breton and in Chaleur bay. In addition to this, the shores of the Gulf are rendered exceptionally advantageous for fish-drying, owing to their immunity from the fogs that sweep in upon the southern or Atlantic coast of Nova Scotia.

The catches of both the in-shore and the off-shore fishermen are mostly all split and salted for drying purposes. There is a vast difference, however, between the dried products of the two modes of fishing. Cod that is split on

board of a deep-sea vessel is heavily salted, in order to preserve it during the fishing voyage, which sometimes lasts a couple of months. On the other hand, in-shore fish are landed daily, split, and placed in salt for a short time only, then dried. To overcome the difficulty, caused by the frequent presence of fog on the shores of the bay of Fundy and on the southern shores of Nova Scotia, drying by artificial means has been resorted to. Drying by this process is accomplished in about forty-eight hours, as against three weeks by the sun and air process.

The chief markets for dried cod are found in Italy, Spain, Portugal, Brazil, the West Indies and the United States. The largest and best fish are sent to Europe and Brazil; and the inferior kinds to the West Indies. The total value of cod taken by the fishermen of Eastern Canada during the year 1909-10* amounted to $3,847,844.

Other Varieties

Haddock, hake and pollock are taken largely by the in-shore fishermen while fishing for cod.

Halibut are usually found wherever cod are met with. The fishery is not, as a rule, prosecuted as a distinct one, the fish being taken in considerable quantities by the cod fishermen.

Herring.—Although the herring fishery falls below some others in money value, it is in some respects the most important of all the Eastern Canadian fisheries, inasmuch as the success or failure of the great hook-and-line fisheries depends to a great extent on the abundance or scarcity of the supply of herring for baiting purposes.

In the spring of each year, without fail, large masses of herring move close in to the shore, and are literally washed up on the beaches, in many parts of the gulf of St. Lawrence, especially. The mode of capture is by fixed trap and gill nets set close to the shore. The spring herring is poor in quality; but it provides an abundant supply of fresh bait for the cod fishing fleet in its first voyage to the "banks," while much of it is salted and stored for baiting lobster traps throughout the lobster fishing season. In the summer and fall, herring of an extremely fine quality abound; but they do not come so near the shore as in the spring, and, as a consequence of the use of the same fixed fishing gear, the summer catch is a small one.

Sardines.—A very important sardine fishery is carried on in Passamaquoddy bay, New Brunswick, and the waters around the islands of Grand Manan and the West isles at the mouth of the bay of Fundy. It is the only one of its kind in Canada. Strictly speaking, the fish is not a sardine at all, but simply a young herring.

This fishery has been the means of building up a notable canning industry in the course of the last thirty years. When the canning of these fish com-

*This refers to the fiscal year ending March 31, 1910. Elsewhere in this paper, also, the year 1910 means the fiscal year 1909-10.

menced, considerable quantities were canned in establishments on Canadian soil; but the United States, being the chief market for the canned sardines, the government of that country, by placing a prohibitive duty on the manufactured article, while granting free admission to the raw material, practically transferred the canning industry from Canada to the nearby towns of Eastport and Lubec in the state of Maine; so that now the fish are supplied by Canadian fishermen from Canadian waters, and canned mostly on United States soil.

Mackerel.—The mackerel fishery is a very important one on all parts of the seaboard of Eastern Canada. While little of an accurate nature is known concerning the annual appearance and disappearance of mackerel, it is well known that they appear annually off the mouth of the bay of Fundy about the middle of May, and at various points on the coast of Nova Scotia as the season advances, until in June they swarm into the Gulf. From that time they are found more or less abundantly until the early part of November, when they disappear entirely from Canadian waters.

Seal.—Although seal hunting can scarcely be classed as a branch of the fisheries, nevertheless, being part of the resources of our eastern seas, it may be mentioned, in passing, that in the gulf of St. Lawrence—chiefly around the Magdalen islands—an important seal hunt is made annually on the ice in the spring. In a good year as many as 40,000 seals are killed and landed at the islands.

Steam Trawling.—Since 1908, steam trawling, the latest and most successful mode of capturing large quantities of fish ever put into operation, has been tried in a small way on the coast of Nova Scotia. This method consists in the dragging, by a steam vessel, of a strong, bag-shaped net over the sea-bottom, for the capture of all kinds of fish.

It is a fact that wherever this style of fishing has been introduced, it has been denounced in the most decided manner by fishermen who use hooks and lines. Trawling is an expensive mode of fishing, and requires a large and ready outlet for all kinds of fish in their fresh state, at good prices, the price of salt fish being generally too low to permit of profitable working for that trade alone.

Our cod, haddock and such fisheries are gradually undergoing a change from preponderating salt-fish businesses to fresh-fish ones. Boat fishermen have become alive to the fact that, in order to meet the demands of the rapidly growing fresh-fish trade, they must be able to reach port from the fishing grounds with their perishable cargo in the shortest possible time; and so to-day we find no fewer than 2,304 boats belonging to the eastern fishery fleet fitted with gasoline engines, and in a position to make speed through head winds and calms.

The Lobster Fishery of Canada*

Advent of the Cannery.—The lobster fishery in Canada was of no importance until the time of the introduction of canning. Canning was introduced into Canada from the Northern United States, apparently in the latter part of the sixties. Even at that early date the lobster fishery in the coastal waters of the Northern States was in a seriously depleted condition owing to the intensive fishing that had been carried on, and those who were engaged in it saw in the Canadian fishery a magnificent opportunity of continuing their industry. At that time lobsters were very abundant all along the five thousand miles of Canadian coast line from Passamaquoddy bay to Labrador. In fact, they were found inshore much earlier in the season than they are now, no doubt being driven there for food. It was not an uncommon thing after a heavy storm to find windrows of lobsters stranded on the coast. These were merely carted away by the farmers for fertilizer. It is not surprising, under these conditions, that when a method became known whereby these lobsters could be made available for human consumption, could be put up in such a way that even upon remote sections of the coast they could be turned into a desirable marketable article, the method spread with great rapidity. In 1869 when canning was nicely started in Canada there were 61,000 one-pound cans put up. The very next year the quantity increased to half a million, and in 1871 it went up to over the million mark. Ten years later it reached its zenith with a pack of over 17,000,000 pounds. From that time on there were the usual ups and downs in the catch, owing to weather conditions generally; but the trend was downwards until about 1898, when the production was somewhere about the 10,000,000 pound mark, and by 1909 it had still further declined to 9,000,000 pounds. For about ten years it was stationary, and arguments began to be forthcoming that the time had come when the lobster fishery had reached a state of equilibrium, that it would not increase or decrease any more, but that natural reproduction would keep up the supply.

FUR FARMING IN CANADA

A report entitled *Fur Farming in Canada* was prepared in 1913 by Mr. J. Walter Jones. It deals with the various species of fur-bearing animals in Canada, but special attention is given to the fox-farming industry in Prince Edward Island. It is the first book of its kind ever published in Canada and the demand for it has been so great that the supply is exhausted.

Phenomenal activity took place in the fur-farming industry in 1913, especially on Prince Edward Island. Down to the present year, there were no statistics available. But, at the last session of the Prince Edward Island legislature, provision was made for imposing a tax of one per cent upon the value of the young foxes born from year to year. Under the provisions of this Act, an enumeration was made in August last of all the fox ranches and the foxes in

*From the report of W. A. Found, Supt. of Fisheries of Canada.

captivity on the Island, together with a sworn valuation of the young foxes reared this year.

As a result of this census, it was found that there are 233 fox ranches. In these ranches, 2,480 foxes of all grades are in captivity, of which 1,325 are classed as silver-black. The sworn valuation of the young foxes this year was slightly over $3,700,000.

The development of the fur-farming industry in Canada has been remarkable. As a legitimate industry, it is profitable in the extreme and capable of very great expansion and variation. While all persons who engage in this industry cannot expect to reap the enormous profits which some in Prince Edward Island have realized, it remains an undoubted fact that the supply of fur taken from animals in a state of nature is constantly diminishing and that there is a continuing and never-failing market in the world, at high prices, for high grade furs. These furs can only be produced under certain climatic conditions. It is nature that clothes the animal with the valuable coat of fur suited to its environment. This environment is found in the natural conditions of Canada. To reap the profits of our geographical and climatic advantages, all that is necessary is to exercise the same care and judgment that would be requisite in any other line of production.

The number of farms in Canada on which these animals are kept has greatly increased. If one were to look over the statistics from the various provinces, one would find that there are licenses in Nova Scotia for possibly one hundred and fifty fur farms; in New Brunswick, for a similar number and in Prince Edward Island, the number has probably increased three-fold or four-fold during the year, while in all the other provinces of Canada fur farms have been established. In the main, however, the industry is centred in Prince Edward Island, and for a long time to come, people the world over, who desire high grade breeding animals will come to the Island for them. So that in addition to the fur business the farmers of the Island are engaged in supplying breeding animals to stock other farms.

A question often asked is: How long will the fox farming industry last? So far as the breeding of silver foxes is concerned, it would depend upon what price the fur would bring when the pelts are placed on the market.

The whole basis of this industry rests upon a continuance of the demand for furs. It is well known that furs of good appearance are extremely scarce at present. Nearly all the stocks of furs today are comprised of cheap skins, dressed and dyed. A few staples may still be had, but these are rapidly becoming mere specialties, such as silver fox, chinchilla, Russian sable and broadtail. Mink skins were worth fifty cents each ten or twelve years ago; today, they are worth $6.00 each. Speaking generally, it is safe to say that the price of furs has advanced three hundred per cent in 15 or 20 years. The world buys about $350,000,000 worth of manufactured furs annually.

The black and dark silver prime skins from foxes of Prince Edward Island sell in London for as high as $2,000 each. As high as $35,000 is paid for a pair of the best quality breeding black foxes.

From the Journal of a Factor in the Hudson Bay Country

In "A Summer and Winter on Hudson Bay," C. K. and A. T. Leith reproduce a highly interesting portion of the day journal of one John Clark, factor of the Hudson Bay Co's. post at Little Whale River. Only portions of the record are here reprinted, the purpose being to show the great number of fur-bearing animals caught by four or five men. The journal is for the winter of 1876-1877, "a great fox year."

Nov. 1—Shot 9 white foxes.

Nov. 2—15 foxes and a wolverine.

Nov. 4—8 white foxes, 1 blue fox, 1 red and 1 cross; total, 11.

Nov. 8—"I got 9 partridges and 4 white foxes; Adam 7 partridges; David 20 partridges and 5 white and red foxes; Swanson 6 white foxes; Moses 16 partridges."

Nov. 9—David and self got 21 white foxes and 1 blue fox.

Nov. 10—Total for me today, 20 foxes; David, 17; Adam, 6.

Nov. 11—David got 14 foxes; Swanson, 8; Adam, 3; self, 11.

Nov. 12—The men got 50 white foxes between them.

Nov. 13—I got 18 white foxes; Snowboy, 3; David, 11.

Nov. 14—The men got 30 foxes from their traps.

Nov. 15—The men got 24 foxes from traps.

Nov. 16—David got 30 foxes; Adam 16; Swanson 4; Moses 6; and they got 4 from my traps.

Nov. 17—David got 6 foxes, and self, 13.

Nov. 18—David got 8 foxes; Moses 10; Adam, 2; Swanson and self, 34.

Nov. 20—I got 26 white foxes.

Nov. 21—I got 13 white foxes.

Nov. 23—I got 8 white foxes in traps, and shot 11 white and 1 blue fox; total 20. "The men get foxes morning and evening so I can keep no track of the number they get."

Nov. 25—Self got 15 white foxes from traps and shot 26.

Nov. 27—Self got 12 foxes from traps and shot 3.

Nov. 30—Self got 5 white foxes from traps and shot 15.

* * * * * * * * * * * * * * *

April 6—Between us, self and four servants, we have 5 silver, 9 cross, 15 red, 11 blue and 1235 white foxes, the best hunt ever made by the servants at this place.

April 28—Over 9,000 white foxes now on hand.

The strip of land along Hudson River from New York City to Cohoes, including Bergen and Middlesex counties, N. J., is the greatest brick-making district in this country, and probably in the world. New York City is the leading common brick market in the United States, about a billion bricks being used there annually, the principal source of supply being the Hudson River region.

TEST YOUR KNOWLEDGE OF AMERICAN CITIES

THE following table gives the name of the largest city in each state. Cover the column containing the names of the cities, and test yourself on the list:

State	City	Pop. in 1000's in 1910	State	City	Pop. in 1000's in 1910
Ala.	Birmingham	133	Nebr.	Omaha	124
Ariz.	Tucson	13	Nev.	Reno	11
Ark.	Little Rock	46	N. C.	Charlotte	34
Calif.	San Francisco	417	N. D.	Fargo	14
Colo.	Denver	213	N. H.	Manchester	70
Conn.	New Haven	134	N. J.	Newark	347
Del.	Wilmington	87	N. M.	Albuquerque	11
D. C.	Washington	331	N. Y.	New York	4,767
Fla.	Jacksonville	58	Ohio	Cleveland	561
Ga.	Atlanta	155	Okla.	Oklahoma City	64
Ia.	Des Moines	86	Ore.	Portland	207
Ida.	Boise City	17	Pa.	Philadelphia	1,549
Ill.	Chicago	2,185	R. I.	Providence	224
Ind.	Indianapolis	234	S. C.	Charleston	59
Kans.	Kansas City	82	S. D.	Sioux Falls	14
Ky.	Louisville	224	Tenn.	Memphis	131
La.	New Orleans	339	Tex.	San Antonio	97
Mass.	Boston	671	Utah	Salt Lake City	93
Md.	Baltimore	558	Va.	Richmond	128
Me.	Portland	59	Vt.	Burlington	20
Mich.	Detroit	466	Wash.	Seattle	237
Minn.	Minneapolis	301	Wis.	Milwaukee	374
Miss.	Meridian	23	Wyo.	Cheyenne	11
Mo.	St. Louis	687	W. Va.	Wheeling	42
Mont.	Butte	39			

Notes on American Cities

Massachusetts has 293 manufacturing establishments each of which makes upwards of a million dollars' worth of products a year. The 16 southern states all together have only 297, or 4 more than the little state of Massachusetts. New York has 470 such establishments, while the 22 states west of the Mississippi have 452, or 18 less than New York alone. Of the 3060 such concerns in the United States, 1875, or over 60 per cent, are in six states, New York (470), Pennsylvania (400), Massachusetts (293), Illinois (273), Ohio (245) and New Jersey (194).

Five states of the Union (Ark., Del., Md., Mont., Ore.) have only one city each with over 25,000 population, while Massachusetts alone has 25 such cities.

The United States has 50 cities of over 100,000 population and 29 of them are north of the Potomac and Ohio, and east of the Mississippi.

New Jersey has 14 cities ranging from 30,000 to 350,000 population and 11 of them are within sight of the tower of the Metropolitan building in New York.

New York has 9 cities of over 50,000 population and all of them are on the Erie Canal-Hudson River waterway.

Over 90 per cent of the people of Massachusetts, Rhode Island and Connecticut live in cities of 2500 or more population, but less than 15 per cent of those of North Carolina, South Carolina, Mississippi and Arkansas. In 14 states the urban population constitutes over 50 per cent of the total. It is not a little surprising that in the three Pacific Coast states, over half of the people live in cities; yet these are among our youngest states. Even in the five great agricultural states of the east north-central group (Ohio, Ind., Ill., Mich. and Wis.) the city population already exceeds the rural. Yet in the east south-central group (Ky., Tenn., Ala., and Miss.) only 19 per cent of the people live in cities. R. H. W.

The Cottonseed Industry

In twenty-five years the value of American cottonseed products has risen from $20,000,000 to $136,000,000, and many people in the cotton districts can remember when the cotton seed accumulated in huge piles about the ginneries, just as sawdust does near the sawmills; and it was just as worthless as the sawdust. Today the cotton fields of the United States have to a large extent replaced in the American economic system the olive groves of the Mediterranean district. The oil is a first-class edible product and the cake left after crushing the seed constitutes an equally valuable cattle feed.

Three-Fourths of the World's Coal in the Possession of the English-Speaking Peoples

The United States contains one-half of all the known coal of the world. The entire British Empire contains one-half of the remainder, and all of the rest of the world the other half. It has often been said that China contains more coal than any other country, but the investigations made for the International Geological Congress seem to show that China's reserves are smaller than had been reported. It is not a fabric of the imagination that causes men to predict that the nations which control the coal of the world hold the key to the future. It is a matter of tremendous significance that the United States holds half the world's coal and that the English speaking people hold three times as much as the rest of the world.

THE SUN

1. It is 92,500,000 miles from the earth. This means that an express train traveling 50 miles an hour, or 1200 miles a day, or 438,000 miles a year, would require over 200 years to reach the sun.

2. The earth is about 3,000,000 miles nearer the sun in perihelion than in aphelion, and receives about 7 per cent more heat at that time.

3. The earth is nearest the sun in our winter, but the northern hemisphere then being tipped away from the sun, receives the sun's rays—or waves —least effectively.

4. The sun is of enormous size; 865,000 miles in diameter and possessing more than 300,000 times as much matter as the earth. If the sun were a hallow sphere of its present size and the earth were placed at the center, the moon could revolve about the earth in its regular orbit entirely within the sun, and have a wide margin to spare. Such a hallow sphere would hold more than a million balls the size of the earth. Of all the material which makes up the solar system—the sun, 8 planets, 800 asteroids, 26 moons, besides comets, and meteors—the sun alone contains 99.8 per cent.*

5. Neptune, the most distant of the sun's family of eight planets, requires 165 of our years to complete one revolution around the sun.

6. The temperature of the sun is computed to be about 6,000 degrees centigrade or twice as hot as the electric arc. It sends to the earth annually enough heat to melt a shell of ice 105 feet thick enclosing the entire earth; yet the earth receives only a two-billionth of the heat emitted from the sun.

7. The sun is not a burning body in the sense that coal or oil or gas burn. It is believed to be entirely gaseous. It is known to contain iron, gold, hydrogen—in fact, at least 40 of the same elements which make up the earth; yet all of the elements are vaporized by the intense heat. But, despite this gaseous condition, the enormous size of the sun makes the pressure upon the inner portions such that the entire body of the sun is 1.4 times as heavy as water. (The earth's density is 5½ times that of water).

8. The source of the sun's heat is not satisfactorily explained. The theory that the heat is kept up through an incessant raining of asteroids or meteors upon the sun has been largely abandoned. Contraction has been offered as an explanation, but this could supply the heat for not over 15 million years, and this is wholly inadequate. The explanation is now being sought in the field of the radio-active elements, such as radium and helium, and the sun is known to contain an abundance of the latter.

9. The so-called "sun-spots" are of great size. The earth could be dropped into the larger ones. "They appear to be whirls of material coming outward from the inner layers of the sun toward the surface, spreading out like a waterspout." Sun spots appear in greatest numbers in periods 11 years

*See excellent article by Director W. W. Campbell on "The Evolution of the Stars and the Formation of the Earth," in *The Popular Science Monthly*, Sept., 1915, Vol. 87, p. 209.

apart and at these times they exert a pronounced effect upon the magnetic condition of the earth.

10. The sun rotates upon an axis, but, strangely, the equatorial portion of the sun's surface rotates nearly one third faster than portions at 75° latitude, showing that it is not a rigid body.

11. The radiations, or waves, which emanate from the sun, while carrying "potential" heat and light, do not either heat or illumine the space which they traverse; this space is both dark and cold despite the fact that it is filled with the sun's radiations. Only when these radiations strike material objects is light and heat, as such, developed. R. H. W.

SOME PERSISTENT ERRORS IN GEOGRAPHY

MANY people apply the term *Rocky Mountains* to the entire mountainous region of the western United States. The Rocky Mountains are only the eastern ranges of this system and in Colorado are a thousand miles from the Pacific Coast.

Some maps and many of the older geographies refer to the Gulf Stream as washing the shores of Europe. The Gulf Stream frays out and wholly loses its stream-like character before it has passed half way across the Atlantic. Its waters mingle with those of the ocean and become a part of the great North Atlantic Drift which is driven slowly toward the coast of western Europe by the prevailing south-west winds. It is true, however, that western Europe derives a great deal of heat from the winds which blow over this warmed body of water.

It is frequently stated that the frigid zones have six months' day and six months' night. Only two points on the earth actually have six months' day and six months' night, the poles themselves. The longest day or night at the polar circles is only 24 hours. But the exceedingly prolonged dawn and twilight of the frigid zones give these regions a condition almost like daylight even when the sun is not above the horizon.

The impression is often given that the great harbors of the world are by nature suited to the needs of commerce. Millions of dollars have been spent and must continue to be spent to make and keep even excellent harbors suitable for modern commerce.

A quarter of a century after Syracuse, N. Y., had ceased to be an important salt-producing center, text books and some teachers were still describing it as "noted for its great production of salt."

Brazil no longer produces diamonds enough to be worthy of mention. Yet its reputation as a diamond field will probably continue a generation longer.

Pennsylvania mines are now producing almost no iron ore and have not for twenty years, yet this is news to a great many well-posted teachers.

RECENT PUBLICATIONS

AN INTRODUCTION TO SCIENCE. By Bertha M. Clark. 494 pp. American Book Company. 1915.

In her preface, the author says: "The aim of this book is to start young high school pupils on scientific projects which will influence for good their *present* lives." The book is highly practical. It deals with menus, the use of paints and varnishes, selection of fuels, school and home lighting, labor saving devices, the use of chemical agents to transform grease and sewage into useful products, such as soap and fertilizers, the application of hygienic facts and theories to sanitation, cooking, and many kindred topics. It is, in fact, a manual of elementary applied science, with only enough theory to explain the main principles involved. The last eight chapters deal with subjects usually treated in physical geography. The success of the author's earlier book, her experience as a teacher, and the thoroughly practical type of knowledge in this book all seem to combine in promising it a cordial reception.

COMMERCIAL GEOGRAPHY. By Alex. L. Curr. An Intermediate Textbook. A. & C. Black, London. 1915. 440 pp., 150 figures. $1.10.

The book has much to commend it and one rather serious weakness. The latter is the frequency of errors. On page 275 we are told that half of the sugar beet crop of the United States is produced in Utah, while, as a matter of fact, scarcely one-ninth is produced there. Colorado, which produces three times as many sugar beets as Utah is not mentioned. On page 277 we are told that cheese comes mainly from the western states. For decades New York was the leading producer of cheese and is still second. That a source of petroleum, "described as one of the largest in the world," is in British Columbia, will surprise many. It must be admitted, however, that no one can write a commercial geography which does not contain a sprinkling of errors.

The book is well illustrated with sketch maps and diagrams but contains no colored maps. Important words are printed in black-face type. Questions follow the chapters; the causal idea is emphasized and statistics are reduced to a minimum.

SOUTH AMERICA: A GEOGRAPHY READER. By Isaiah Bowman; pp. XXII+354. Rand, McNally and Co., Chicago, 1915. 75 cents.

This is the second volume in the *Lands and Peoples Series*. The first volume is Ellsworth Huntington's "Asia." The series is under the editorial direction of Professor R. E. Dodge of the Teachers' College, Columbia University. The book is authoritative, thoroughly interesting in subject matter, and delightfully written. Professor Bowman has spent several years in exploration in South America and has seen many of the regions which he describes; this gives his descriptions that realistic quality which comes only from first-hand knowledge. There are upwards of 150 half tone illustrations, numerous sketch maps and drawings, and 12 colored maps. Some of the half tones are excellent; others fail in clearness of detail owing perhaps to the

character of the paper upon which they are printed. Human geography receives the emphasis, as it should, particularly in a reader for children. There is no "writing down" and as a consequence the book is quite as interesting to adults as to children. Occasionally the phraseology seems a little too old for grade pupils, yet this is infrequent. The subject matter is so interesting and the way of presenting it is so pleasing that pupils who read it are sure to be carried along as by a good story. We cannot help wondering if it would not be better if we made our text books in geography upon similar models. Such a book as this is no inconsiderable contribution to the geography of South America.

EARLY ECONOMIC CONDITIONS AND THE DEVELOPMENT OF AGRICULTURE IN MINNESOTA. By Edward Van Dyke Robinson. Bulletin of the Univ. of Minnesota, Studies in the Social Sciences, No. 3, Minneapolis, 1915, 306 pp. 221 maps and diagrams.

Under the title "Early Economic Conditions and the Development of Agriculture in Minnesota," Dr. E. V. Robinson describes the economic history of a typical western state. Minnesota contains open prairie, hardwood forest and coniferous forest, and shows quite a wide variety in both soil and climate. Situated on the border of the semi-arid belt the state has perhaps been more subject to crop failures than have those to the east but on the whole is typical of the upper Mississippi Valley. These features are described in some detail in the first chapter.

In the time when fur-trading was the dominant industry, local agriculture was unable to supply the population. General agriculture was then favored by high prices. By 1850 fur-trading was giving place to lumbering but with other conditions substantially unchanged. But by 1860 an economic revolution had been accomplished. Settlement increased rapidly and wheat soon became the dominant crop. From 1860 to 1880 wheat held full sway. But the rapidity of the opening of new lands combined with the fall of prices following the Civil War, resulted in a prolonged period of agricultural depression. Crop failures and exhaustion of the soil also played their part in the next revolution from wheat-growing to dairying, a change still in progress. As the result of the use of machinery, experience has shown that farms should be larger than formerly, a process which has reduced the country population in large parts of Minnesota. The smaller families of modern times are believed to be in part due to the effect of machinery, as less labor is now required. However, the coniferous region still awaits settlement.

The report is profusely illustrated with dot maps, charts and graphical diagrams, often scattered in a confusing way through the text. While usually of excellent character, many of these are poorly drawn and lettered. There is no index.

F. T. Thwaites.